



# VISION IAS

www.visionias.in

## GENERAL STUDIES (TEST CODE : 2365)

Name of Candidate	KSHITIJ ADITYA SHARMA		
Medium Eng./Hindi	ENGLISH	Registration Number	45933652
Center	ONLINE	Date	06-09-2024

INDEX TABLE			INSTRUCTIONS	
Q. No.	Maximum Marks	Marks Obtained	<p>1. Do furnish the appropriate details in the answer sheet (viz. Name, Registration Number and Test Code). उत्तर पुस्तिका में सूचनाएं भरना आवश्यक है (नाम, प्रश्न-पत्र कोड, विद्यार्थी क्रमांक आदि)।</p> <p>2. There are <b>TWENTY</b> questions printed in <b>HINDI &amp; ENGLISH</b>. इसमें बीस प्रश्न हैं हिन्दी और अंग्रेजी में छपे हैं।</p> <p>3. <b>All questions are compulsory.</b> सभी प्रश्न अनिवार्य हैं।</p> <p>4. The number of marks carried by a question/part is indicated against it. प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं।</p> <p>5. Answers must be written in the medium authorized in the Admission Certificate, which must be stated clearly on the cover of this Question-Cum-Answer (QCA) Booklet in the space provided. No marks will be given for answers written in medium other than the authorized one. प्रश्नों के उत्तर उसी माध्यम में लिखे जाने चाहिए जिसका उल्लेख आपके प्रवेश पत्र में किया गया है और उस माध्यम का स्पष्ट उल्लेख प्रश्न-सह-उत्तर (क्यूसीए) पुस्तिका के मुख्य पृष्ठ पर अंकित निर्दिष्ट स्थान पर किया जाना चाहिए। उल्लिखित माध्यम के अतिरिक्त अन्य किसी माध्यम में लिए गए उत्तर पर कोई अंक नहीं मिलेंगे।</p> <p>6. Word limit in questions, if specified, should be adhered to. प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए।</p> <p>7. Any page or portion of the page left blank in the Question-Cum-Answer Booklet must be clearly struck off. उत्तर पुस्तिका में खाली छोड़ा हुआ पृष्ठ या उसके अंश को स्पष्ट रूप से काटा जाना चाहिए।</p>	
1	10			
2	10			
3	10			
4	10			
5	10			
6	10			
7	10			
8	10			
9	10			
10	10			
11	15			
12	15			
13	15			
14	15			
15	15			
16	15			
17	15			
18	15			
19	15			
20	15			
<b>Total Marks Obtained:</b>			<b>Is student recommended for One-to-One mentoring?</b>	
<b>Remarks:</b>				
			<b>Recommended</b>	
			<b>Strongly Recommended</b>	

16-B, 2<sup>nd</sup> Floor, Above National Trust Building, Bada Bazar Marg, Old Rajinder Nagar, Delhi-110060

Plot No. 857, 1st Floor, Banda Bahadur Marg (Opp. Punjab & Sind Bank), Dr. Mukherjee Nagar, Delhi- 110009

## EVALUATION INDICATORS

1. Contextual Competence
2. Content Competence
3. Language Competence
4. Introduction Competence
5. Structure - Presentation Competence
6. Conclusion Competence

Overall Macro Comments / feedback / suggestions on Answer Booklet:

1.

2.

3.

4.

5.

6.

VisionIAS

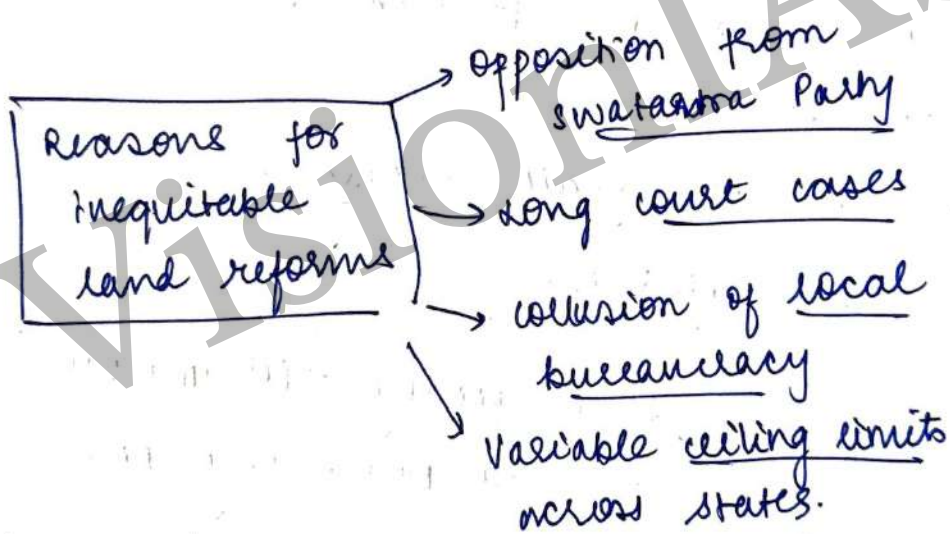
All the Best

Q1.

प्रभावी एवं न्यायसंगत भूमि सुधारों की अनुपस्थिति ने भारत में गरीबी की निरंतरता में कैसे योगदान दिया है?

How has the absence of effective and equitable land reforms contributed to the persistence of poverty in India? (Answer in 150 words) 10

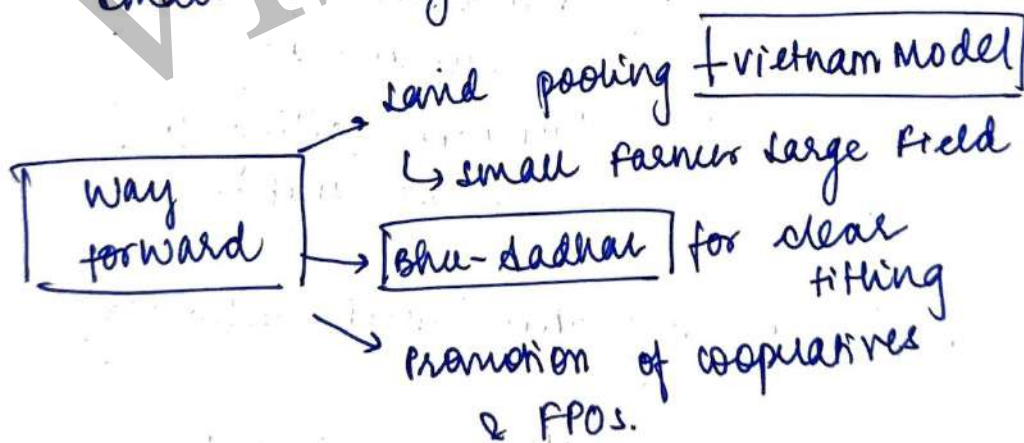
The economic survey 2024 highlights that 89.4% farmers have less than 2 ha of land, in part due to the failure of land reforms such as land ceiling laws & redistribution.



Consequence of ineffective land reforms

- ① Poor economies of scale in Indian agriculture due to small holdings.
- ② Lack of proper land records and

- lack of conclusive titling of land.
- ③ limited the scope of green Revolution during the 1960s & 70s to only a few parts in west & south.
- ④ ICOR of agricultural inputs remains high
- ⑤ Problems in collection of land tax in rural areas due to lack of clear records.
- ⑥ challenges of credit access due to small holdings.



Thus, to achieve the goal of doubling farmer income and productivity, land use reforms would be the first step.

Q2.

यूनिफाइड पेमेंट इंटरफेस (UPI) ने भारत में वित्तीय समावेशन को किस प्रकार बढ़ावा दिया है? टिप्पणी कीजिए।

Comment on how the Unified Payment Interface (UPI) has unleashed financial inclusion in India. (Answer in 150 words) 10

UPI was launched by NPCI in 2016.  
As per RBI, India has achieved a  
score of 64/100 in financial inclusion  
index, 2024, aided by UPI's growth.

UPI - unleashing financial inclusion

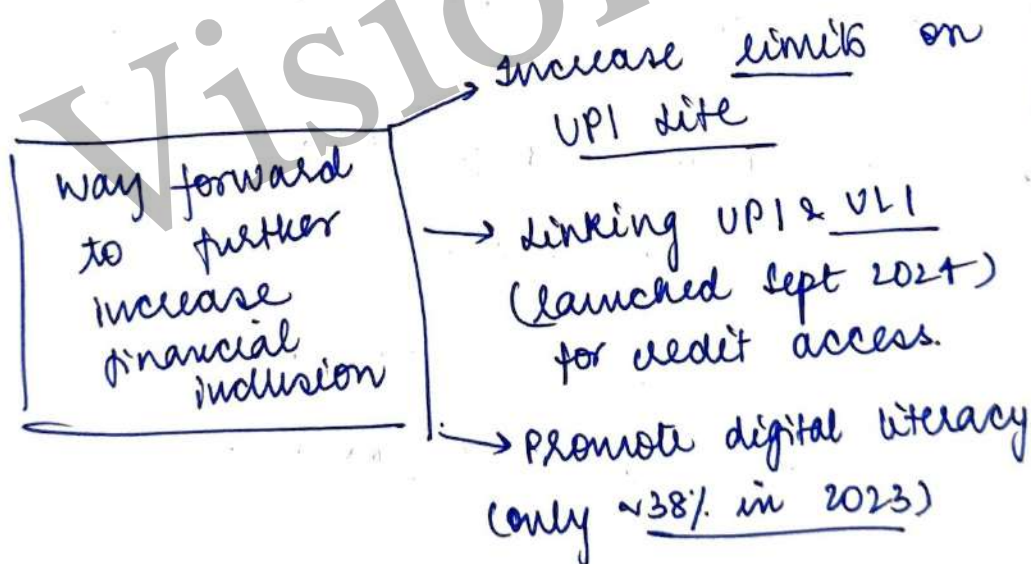
- ① Reduced the cash crunch in rural areas due to low ATM access.
- ② Increased speed of payment settlement reducing payment delays.
- ③ UPI lite has removed the barriers of intermittent internet access.
- ④ UPI 123 PAY helps users with basic phones also access UPI.
- ⑤ Credit line on UPI helps access to

short term credit as overdraft.

⑥ Overall ease of doing business for small vendors has increased due to UPI.

⑦ It has given a sense of confidence in online payments due to sadhaar linkage.

⑧ Reduced dependence on banks for basic financial transactions.



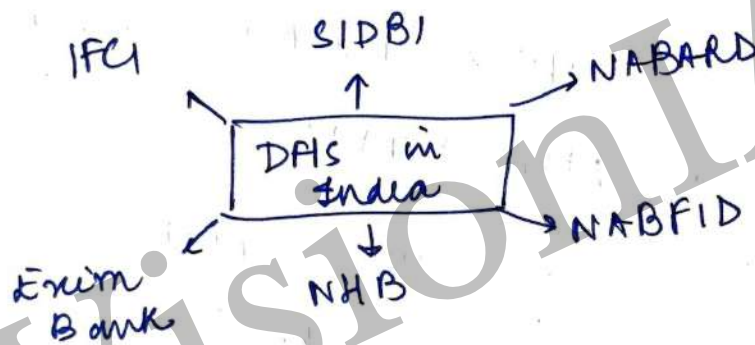
Thus, as World Bank notes, India has achieved 5 decades of progress in a single decade in financial inclusion via UPI.

Q3.

भारत की आर्थिक संवृद्धि और अवसंरचना के विकास को सहायता प्रदान करने में विकास वित्त संस्थानों (DFIs) की भूमिका पर चर्चा कीजिए।

Discuss the role of Development Finance Institutions (DFIs) in supporting India's economic growth and infrastructure development. (Answer in 150 words) 10

DFIs are large credit institutions that promote growth in specified sectors through lending to institutional players rather than to consumers directly.

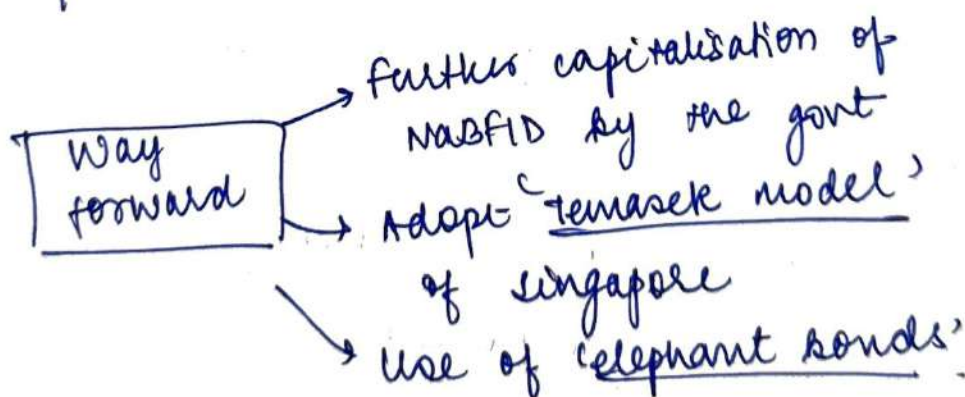


Role in supporting growth & infrastructure development

- ① Provide backstop guarantees to reduce financial constraints.
- ② Augment private capital formation by boosting investor confidence
- ③ Reduce cost of credit through lower

operational costs and higher economies of scale

- ④ Promote new schemes for financial inclusion  
by NABARD led SHG Bank linkage program
- ⑤ NABARD has aided the growth of  
the domestic bond market
- ⑥ opening the capital market through  
promotion of REITs & InvITs.
- ⑦ NHB has held maintain stability  
in the real estate market and  
promote home ownership.



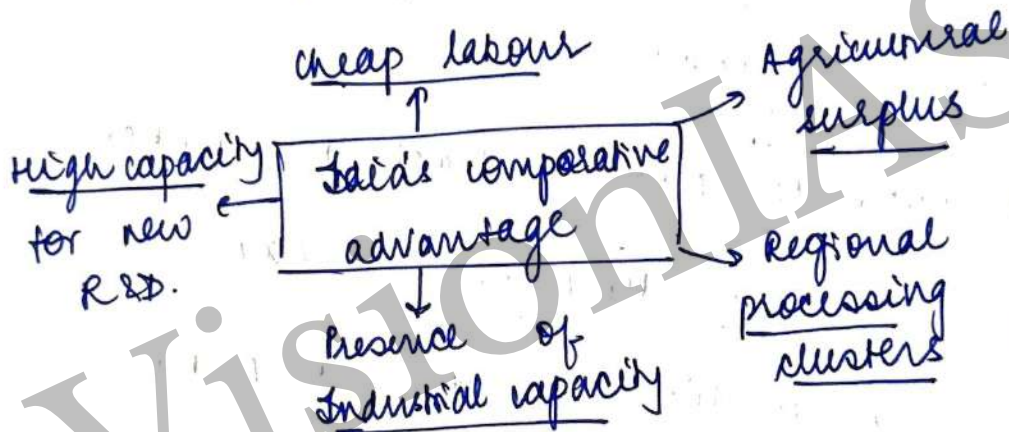
Thus, DFIs are engines of our growth  
story helping India become developed by 2047.

Q4.

भारत को खाद्य प्रसंस्करण के क्षेत्र में अपनी तुलनात्मक बढ़त का लाभ उठाकर इस क्षेत्र को वैश्विक ऊर्जागृह में परिवर्तित करने की आवश्यकता है। विवेचना कीजिए।

India needs to leverage its comparative advantage in food processing to transform the sector into a global powerhouse. Discuss. (Answer in 150 words) 10

As per NABARD data the extent of food processing in India averages around 5-10% with higher rates seen only in milk processing.



Means of leveraging comparative advantage

- ① Promotion of growth and scale of small MSMEs in processing through formalisation. Req via PMFME scheme
- ② Focus on quality and certification to uphold sanitary / phytosanitary standards.

- ④ Reduce logistical costs below 10% to minimise additional overhead.
- ④ More focus on R&D into new and innovative products.
- ⑤ Leverage the growing trend towards healthy foods through millets, ayurvedic goods, etc.
- ⑥ Promotion of Model Contract Farming Act to strengthen upstream linkages.
- ⑦ Providing credit guarantees to MSMEs in the sector to boost exports.  
This is announced in Budget 2024.
- ⑧ Further expand the PLI scheme for food processing.

Thus, India can move towards realising SDG-1, 2, 3, 9 & 10 through a more robust food processing sector.

Q5.

प्लास्टिक जलवायु परिवर्तन में किस प्रकार योगदान देता है? भारत इस दिशा में कई उपायों को प्रारंभ करने के बावजूद प्लास्टिक प्रदूषण को नियंत्रित करने में सफल क्यों नहीं हुआ है?

How do plastics contribute to climate change? Why has India not been successful at controlling plastic pollution despite initiating several measures? (Answer in 150 words) 10

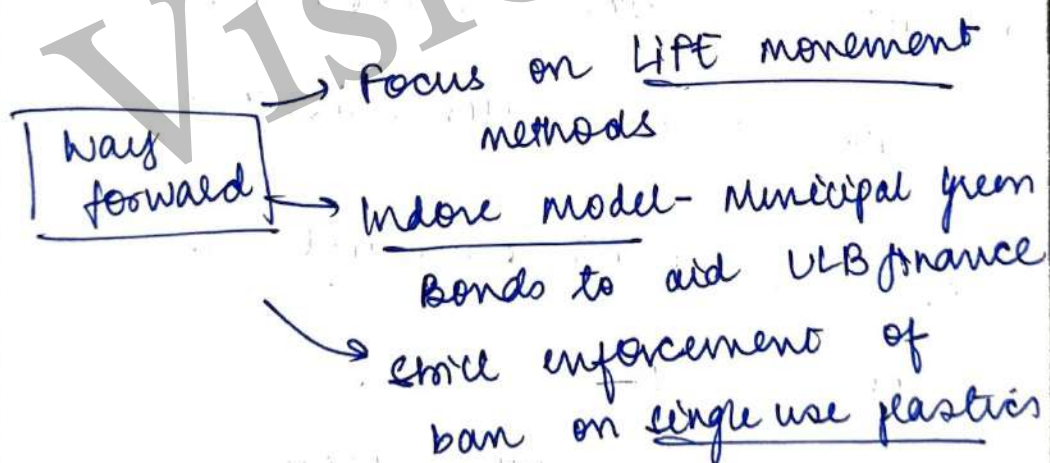
India is presently the third largest user of single use plastic and this has serious ramifications for both pollution & climate change.

Contribution of plastics to climate change

- ① Dumping into landfills causes land degradation → weakens sequestration.
- ② Incineration creates GHG emissions
- ③ use of crude & oil byproducts for production of plastics.
- ④ slow pyrolytic degradation produces even more greenhouse gas emissions  
eg Release of methane.

## Reasons for low success in reducing plastic pollution

- ① Proliferation of single use plastics
- ② weak mechanism of ~~ext~~ extended producer responsibility.
- ③ High manpower dependence for sorting of plastic waste.
- ④ Low fiscal capacity of municipal bodies
- ⑤ weak waste segregation.



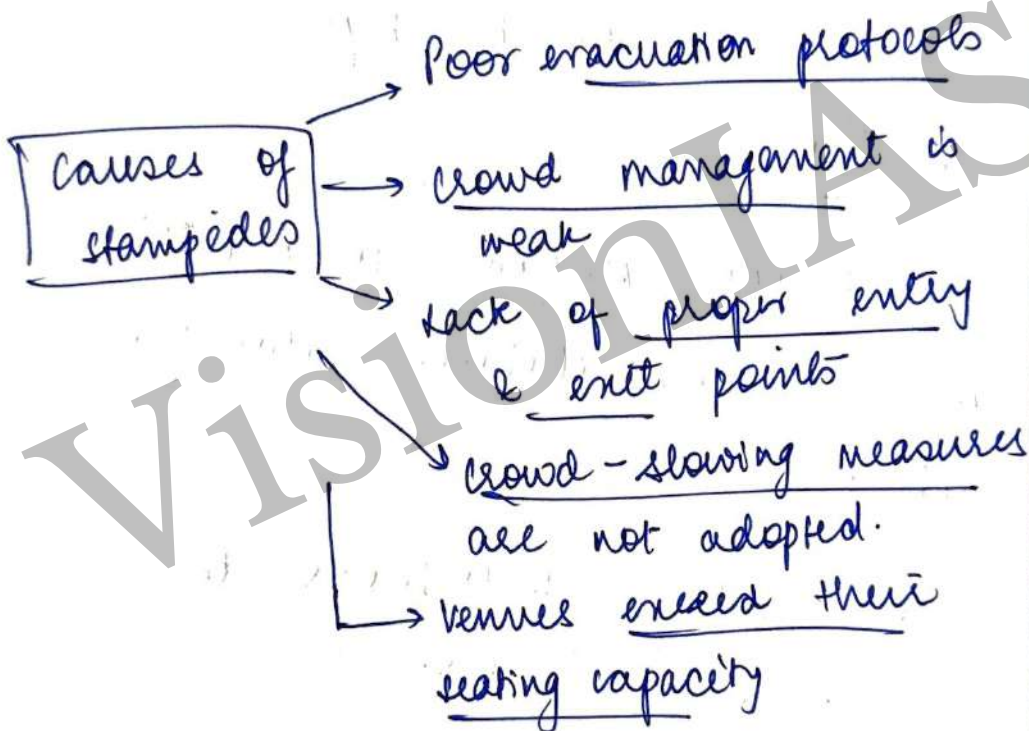
Thus, the ban on plastics' unabated use is crucial to achieve the SDGs - 11, 12 & 13 for a more sustainable future.

Q6.

भारत में सार्वजनिक स्थलों पर अक्सर होने वाली भगदड़ के कारणों की व्याख्या कीजिए। इस तरह की घटनाओं को कैसे रोका जा सकता है?

Explain the causes of frequent stampedes at public places in India. How can such incidents be prevented? (Answer in 150 words) 10

Recently, an incident of a large stampede was seen at a religious gathering at Hathras, UP.



Way forward to prevent stampedes

- ① strict action against venues that deliberately exceed capacity.

- ② Prior notification to authorities to allow crowd control personnel to be deployed.
- ③ clear markings of entry & exit points & clear passage-ways
- ④ ambulances should be kept on stand-by.
- ⑤ Use of traging methods to prioritise pregnant women, children, elderly & disabled.
- ⑥ Use of railings & U-bends to slow down stampedes.

Thus, proper adherence to basic evac norms and venue management can greatly reduce risk of stampedes.

Q7.

ह्यूमनॉइड रोबोट्स के क्षेत्र में हुई नवीनतम प्रगति क्या है? इन रोबोटों के समाज पर पड़ने वाले प्रभावों से जुड़े मुद्दों पर चर्चा कीजिए।

What are the latest advancements in the field of humanoid robots? Discuss the issues surrounding the impact of these robots on society. (Answer in 150 words) 10

Humanoid robots are robotic machines that seek to replicate human mobility to augment / replace human labour in hazardous or experimental areas.

Latest advancements

- ① ISRO has created Vyomanitra & Bheema robots for its Gaganyaan program -
- ② Robot Sophia granted citizenship by Saudi Arabia.
- ③ NASA has been using humanoids in space for almost 2 decades.
- ④ gradual use of robots in the hospitality industry.
- ⑤ used during COVID to maintain safety.

Issues surrounding humanoid.

- ① High cost of development
- ② limited motor abilities compared to the human body.
- ③ creation of technological inequality in the developing world.
- ④ Require private sector participation to reduce budget constraints
- ⑤ Fear and apprehensions about sentient robots

Way forward → Uphold Asimov's 3 laws of Robotics  
 → creating a National Mission for Robotics.  
 → Promote R&D into AI/ML & Humanoids.

Thus, there is a need to ensure productive use of humanoid to promote scientific & economic advancement

Q8.

पुनर्संयोजी डीएनए तकनीक ने जेनेटिक इंजीनियरिंग में किस तरह क्रांति ला दी है? इसके प्रभावों को उदाहरण सहित स्पष्ट कीजिए।

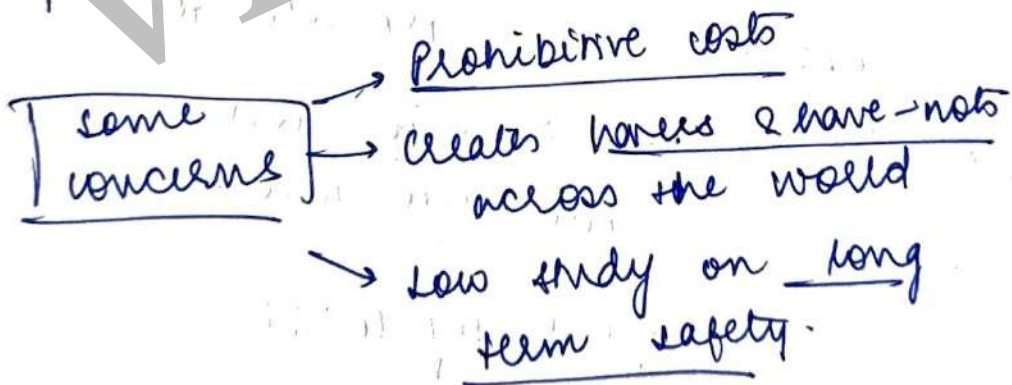
How has recombinant DNA technology revolutionized genetic engineering?  
Provide examples to illustrate its impact. (Answer in 150 words) 10

Recombinant DNA technology uses transgenic genetic material to add certain desirable traits or qualities to an organism.

Role in genetic engineering

- ① Producing GM crops that are more tolerant to pesticides & have more productivity. eg GM Mustard.
- ② GM crops can also promote food security eg vitamin rice using bacterial genes.
- ③ vaccine development eg Conshield
- ④ Use of phytoplankton genes to produce 'grow in the dark' drugs to better track delivery.

- ⑤ Transgenic cows have been used to make human milk.
- ⑥ Development of oil zapper bacteria using recombinant technology to control oil spills.
- ⑦ Insulin gene added to bacteria for bulk production of insulin.
- ⑧ In Japan, human liver genes have been added to goat embryos to produce human liver.



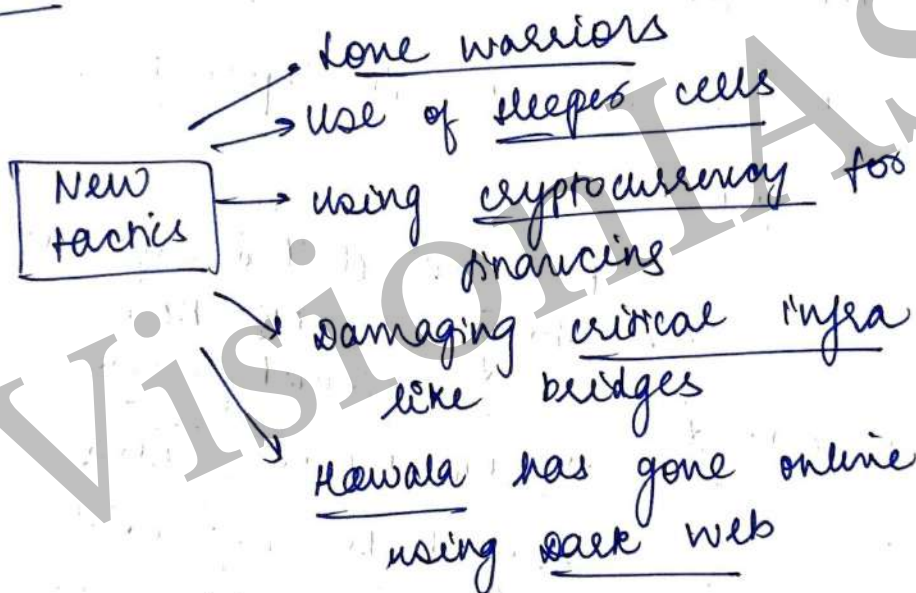
Thus, recombinant DNA tech should be used in an equitable & inclusive manner to share its benefits with all

Q9.

जम्मू-कश्मीर में गैर-राज्य अभिकर्ताओं द्वारा अपनाई जाने वाली नवीन एवं उभरती रणनीतियों ने इस क्षेत्र में गंभीर सुरक्षा चुनौतियां उत्पन्न कर दी हैं। विवेचना कीजिए।

New and evolving tactics employed by non-state actors in Jammu and Kashmir have created significant security challenges in the region. Discuss. (Answer in 150 words) 10

The year 2024 has seen a sudden spurt in cases of violence and terrorism by non-state actors in J&K.



Challenges for security created

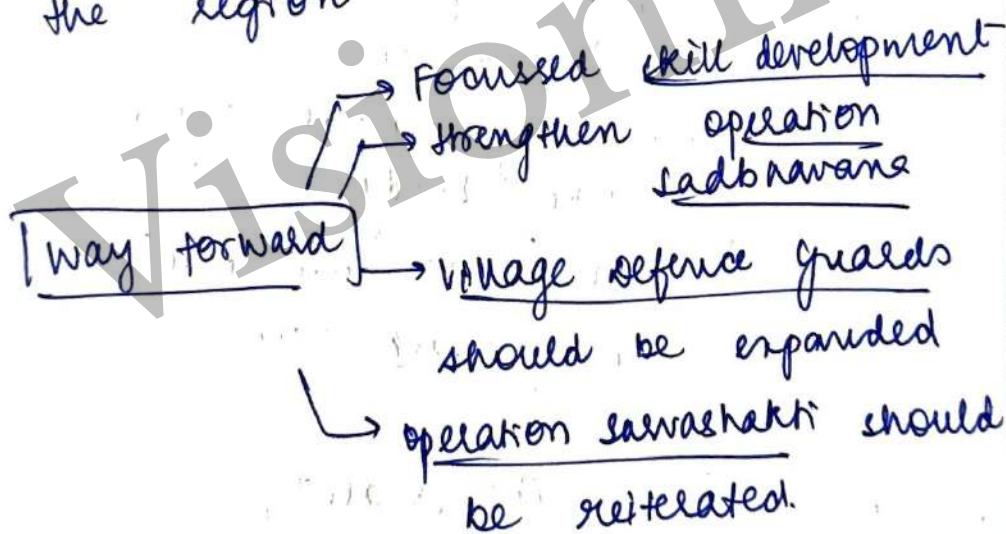
- ① hampering regional integration goal and infra development.
- ② sets private capital formation by

threatening private investors.

③ challenge to the Home Ministry's goal  
of gradual demilitarisation of J&K.

④ Radicalisation of youth further  
affecting bridging the people to people  
contact gap.

⑤ challenges of human development in  
the region



Thus, as PM Vajpayee said, we need  
to uphold Insaniyat, Janhoseeriyat and  
Kaehmiriyat to eliminate terror for good.

Q10.

भारत में उभरती साइबर सुरक्षा चुनौतियों से निपटने के लिए निरंतर नवाचार और दक्षता की आवश्यकता है। इसके मद्देनजर, भारत में साइबरस्पेस की सुरक्षा में CERT-In की भूमिका पर प्रकाश डालिए।

The evolving cybersecurity challenges in India demand constant innovation and agility. In light of this, give out the role of CERT-In in safeguarding cyberspace in India. (Answer in 150 words) 10

As per Surfshark India is the third  
most cyber-attacked nation in the  
world.

Evolutionary cybersecurity challenges

- ① did from state actors for attacks  
eg 2020 Maharashtra cyber attacks  
traced to China.
- ② Use of VPN & Dark web to conceal  
origin.
- ③ Dependence on China-made hardware
- ④ Poor certification standards of government  
websites eg Aadhar leak of 80 Cr Indians  
in 2023.
- ⑤ growing interdependence of the entire  
digital framework via Indiastack.

- ⑥ low penetration of cyber - insurance in India.

### Role of Cert-IN

↳ created under section 78B of IT Act 2008

- ① first responder for ~~the~~ cyber attacks
- ② coordination together with other agencies to reduce vulnerabilities.
- ③ Tracing & intercepting cyber threats  
eg Crz website attacked 16 lakh times per minute by DDoS attacks last year
- ④ laying out guidelines for government departments to follow.
- ⑤ conducting cyber - preparedness exercises

Thus, Cert-IN is a crucial pillar of cyber - security Bharat.

Q11.

भारत में जल-गहन फसल पद्धति की ओर असमान झुकाव क्यों रहा है? संघारणीय जल-उपयोग फसल पद्धति सुनिश्चित करने के लिए लागू किए जा सकने वाले उपायों पर चर्चा कीजिए।

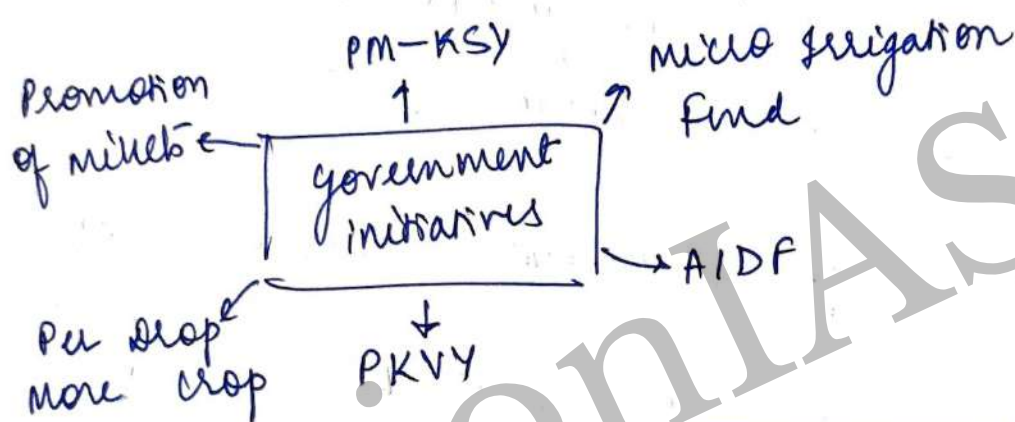
Why has there been an uneven tilt towards water-intensive cropping pattern in India? Discuss the measures that can be implemented to ensure a sustainable water-use cropping pattern. (Answer in 250 words) 15

Starting with the green revolution, India's water use intensity has increased due to a series of government policies and restrictive factors.

Reasons for high water-intensive cropping

- ① Presence of rice/wheat bias in our farming systems
- ② Unintended consequence of government schemes. PM-KUSUM causing depletion of groundwater due to free solar energy.
- ③ Low use of climate friendly practices like system of rice intensification
- ④ Low water use efficiency due to lack of micro irrigation.

- ⑤ evaporation loss up to 40% in water canal systems.
- ⑥ Lack of proper planning of water resource at the state levels.



Way forward for sustainable water use

- ① Promotion of smart agriculture based on resource efficient methods.
- ② Adopt Minis that committee recommendation of shift from land productivity to water productivity agriculture
- ③ Promotion of water use Associations.  
eg Odisha Pani Panchayats

- ④ Rationalise harmful electricity subsidies  
eg Gujarat's pyogram yojana.
- ⑤ Promote local stewardship of water  
resources eg Telangana Mission Kakriya
- ⑥ Boosting micro-irrigation coverage  
through incentives.
- ⑦ Promotion of millets by encouraging  
local captive demand.
- ⑧ Use of HYVs in farming based  
on better water use productivity.  
eg PM Modi launched 109 HYVs  
in August 2014.
- ⑨ Merge CWC + CWDA to create  
a National Water Resource Authority

Thus, sustainable agriculture depends on  
our ability to ensure Normal & Anilal jal  
to every single farmer.

Q12.

विकास एजेंडे में जलवायु परिवर्तन संबंधी चिंताओं को प्रमुखता से शामिल करने के लिए बजट प्रक्रिया के साथ जलवायु वित्त को समेकित करने की आवश्यकता है। इस संदर्भ में, भारत में जलवायु बजट की आवश्यकता पर चर्चा कीजिए।

Mainstreaming climate change concerns within the development agenda requires integration of climate finance into the budgeting process. In this light, discuss the need for climate budgeting in India. (Answer in 250 words) 15

According to the Economic Survey 2021,  
India alone needs USD 1.4 trillion  
in climate finance to meet our  
goal of Net Zero by 2047.

Need for climate budgeting in India

- ① crucial for a 'just, orderly & equitable'  
energy transition as argued by  
the Shree Declaration.
- ② Reduce LCOR of green energy methods  
like solar or wind energy.
- ③ Promote R&D through stable financial  
flows. eg SHIP project for green H<sub>2</sub>.
- ④ Ensuring adequate adaptation to

protect vulnerable groups from imminent climate threats.

- ⑤ Incentivising households to transition to green energy. ~~By~~ Surya ghar Yojana
- ⑥ green finance is required to move away & phase down unabated coal as prioritised by UNFCCC-WG.
- ⑦ Building resilience of infrastructure against climate change.
- ⑧ incentivise adoption of more sustainable construction ~~By~~ Indian Green Building Code

Way forward to ensure climate budgeting

- ① adopt Pigorian taxes to reduce negative externalities. ~~By~~ coal cess.
- ② Adoption of SEBI BRSR standards by all listed companies.

- ③ More transparency in green initiatives  
to reduce greenwashing.
- ④ Adopt Paltha Dasgupta (UK) committee  
recommendations on green finance  
accounting.
- ⑤ Deepening the green bond markets  
through sovereign green bonds
- ⑥ Adoption of carbon credit trading scheme  
to plug CO<sub>2</sub> leakages.
- ⑦ Incorporate social cost of CO<sub>2</sub> emissions  
into budget planning.  
Per for India, it is USD 86 / ton CO<sub>2</sub>

As economic survey showed, India  
already has 5.6% of GDP as adaptation  
relevant finance, showing the growing  
penetration of climate budgeting.

Q13.

भारत में कृषि उपज के भंडारण और विपणन में प्राथमिक कृषि ऋण समितियां (PACS) क्या भूमिका निभाती हैं? हाल ही में प्रारंभ की गई 'सहकारी क्षेत्र में विश्व की सबसे बड़ी अनाज भंडारण योजना' के महत्व पर टिप्पणी कीजिए।

What role do Primary Agricultural Credit Societies (PACS) play in the storage and marketing of agricultural produce in India? Comment on the significance of the recently launched 'World's Largest Grain Storage Plan in Cooperative Sector'.  
(Answer in 250 words) 15

PACS are the grand-Ner bodies in India's rural cooperative credit structure and even today, 40% of KCC loans are processed through PACS.

Role in storage & marketing of agri produce

- ① Reduce post-harvest losses by assisting farmers with credit for transport
- ② construction of godowns for safe storage of grains.
- ③ Promote collective marketing of goods to uphold bargaining power of farmers.

- ④ market linkages with food processing industries. Eg 'Maha-grapes' model
- ⑤ Help small farmers afford transport to reach the APMC to sell their produce.

Significance of world's largest grain storage plan in coop sector scheme

The scheme was announced in 2023 to be implemented by the FCI together with National Cooperatives Development Corporation.

- ① will promote decentralised storage to reduce losses to farmers.
- ② strengthen the e-Negotiable warehouse receipt system to enable credit access to farmers.

- ② promote scientific and hygienic storage
- ④ strengthen the PDS framework by reducing loss from rotting grains.
- ⑤ Promote food security and better implementation of NFSA 2013.
- ⑥ Reduction of logistical costs for the FCI for procurement & storage.
- ⑦ Help rationalise the subsidy burden towards ~~PAC~~ PM-GRAY scheme by rationalising operational costs.

Thus, the PACs can play a crucial role in promoting food security, income realisation and agricultural growth through this scheme.

Q14.

भारत में मौजूदा विमान पत्तनों का विस्तार और नए विमान पत्तनों का विकास केवल यात्रा संपर्क में सुधार तक सीमित नहीं है बल्कि यह कहीं अधिक लाभ प्रदान कर सकता है। चर्चा कीजिए।

The expansion of existing airports and the development of new airports in India can provide benefits beyond merely improving travel connectivity. Discuss. (Answer in 250 words)

15

India is set to become the largest aviation market globally by 2030, and this has ramifications even beyond connectivity.

Benefits of airport expansion beyond connectivity

- ① creation of employment for lakes of persons.
- ② Promoting high value agri exports through KRISHI-UDAN
- ③ Help crowding-in of investment in Tier 2 & 3 cities
- ④ Promote regional and global linkages for trade & tourism.

- ⑤ Can help reduce regional divide in infrastructural growth eg UDAN scheme
- ⑥ Help deepen the penetration of the aviation sector beyond the major urban sectors.
- ⑦ Also serves a strategic purpose by developing landing strips for the air force in emergency cases.

Way forward to promote airports development.

- ① More efficient risk allocation in PPP models to promote confidence
- ② Providing viability gap funding to even more airports
- ③ Boosting creation of land banks to reduce land acquisition hurdles

- ① use 'elephant bonds' to enable access to long term concessional credit.
- ② engaging with multilateral banks to source more credit.
- ③ Improving the quality of auxiliary infrastructure like roads & drainage.
- ④ reviving old & defunct airports  
eg Kharwarho airport of MP

Thus, the growth of airports can have a multiplier effect for the economy well beyond connectivity, as an engine of infrastructure growth

Q15.

भारत अपने ऊर्जा क्षेत्रक में महत्वपूर्ण परिवर्तन लाने के अंतिम पड़ाव पर है और देश की ऊर्जा क्षमता में पर्याप्त वृद्धि करने के लिए तैयार है। इस परिवर्तन को संधारणीय और समावेशी बनाने के लिए क्या आवश्यक है?

India is on the cusp of a significant transformation in its energy sector and is set to substantially augment the country's energy capacity. What makes this transformation sustainable and inclusive? (Answer in 250 words) 15

India is on track to achieve its goal of 500 GW of non-fossil fuel energy by 2030 and diversification of our energy mix.

Elements of India's sustainable and inclusive transformation

① Promotion of a varied mix of energy sources from wind to solar to nuclear.

② R&D into new technologies for clean energy - eg green hydrogen mission

③ Global collaboration for green energy.  
eg collaboration with France for small modular reactors.

- ④ Use of decentralised clean energy  
by surya yuak yojana.
- ⑤ Decarbonisation of industrial sector  
by carbon credit trading scheme  
under CCA, 2001.
- ⑥ Promotion of coal gasification by  
energy companies.
- ⑦ Production of bio-energy through  
GOBARDHAN and SATAT schemes.

Way forward to promote further  
sustainability

- ① moving towards phasing down coal  
towards our net zero goal (2070).
- ② Promoting private sector participation  
in green energy.
- ③ green credits should be used to

- promote energy conserving practices.
- ④ requiring for technology transfer at global fora like COPs of UNFCCC
  - ⑤ Bolstering the Renewable Purchase obligation targets for industries.
  - ⑥ strengthen PLI scheme for photovoltaics to promote decentralisation of solar energy.
  - ⑦ viability gap funding to combined solar & wind farms.

Thus, India is moving towards a cleaner and greener future marked by progress in SDG-11, 12 & 13 as part of our vision of sustainable & inclusive transition.

Q16.

जलवायु परिवर्तन पर संयुक्त राष्ट्र अंतर-सरकारी पैनल (IPCC) ने अपनी हालिया रिपोर्ट में इस बात पर बल दिया है कि नेट नेगेटिव CO<sub>2</sub> एमिशन के लक्ष्य की प्राप्ति के लिए कार्बन डाइऑक्साइड रिमूवल (CDR) आवश्यक है। CDR क्या है? CDR प्राप्त करने के विभिन्न तरीकों का वर्णन कीजिए और इससे संबंधित चुनौतियों की विवेचना कीजिए।

The UN Intergovernmental Panel on Climate Change (IPCC) in its recent report emphasizes that carbon dioxide removal (CDR) will be necessary to achieve net negative CO<sub>2</sub> emissions. What is CDR? Describe the different methods to attain CDR and discuss the associated challenges. (Answer in 250 words) 15

CDR refers to a variety of technologies for storage, sequestration and conversion of CO<sub>2</sub> gas ~~into~~ reduce its atmospheric concentration.

### Methods of CDR

- ① Sequestration through green cover and forests. Tag India's goal of creating an additional carbon sink.
- ② Trapping in empty mines and subterranean crevices
- ③ limestone treatment to convert CO<sub>2</sub> into CaCO<sub>3</sub> in solid form.

- ④ Promoting phytoplankton activity in oceans to boost photosynthesis.
- ⑤ compaction and solidification of CO<sub>2</sub> into solid black carbon.

### Challenges with CDR

- ① Prohibitively high cost of these technologies due to low economies of scale
- ② Low levels of current R&D & dominated by western nations.
- ③ Equitable technology transfer by western countries.
- ④ IPR and patent protections reducing free usage.
- ⑤ CDR alone not enough - should be combined with emission reductions of 47% by 2030

Way forward to promote CDR

- ① Use Anusandhan NRE (Budget 2024) to promote R&D in the sector.
- ② Increase PPP to reduce the current level of dis-economies and promote wider adoption.
- ③ Global collaboration through a new multilateral grouping like ISA for CDR.
- ④ Promoting technology transfer from developed nations at COP-29 this year.
- ⑤ Simultaneous progress on emission reduction and helping RE capacity as per COP-28 goal.

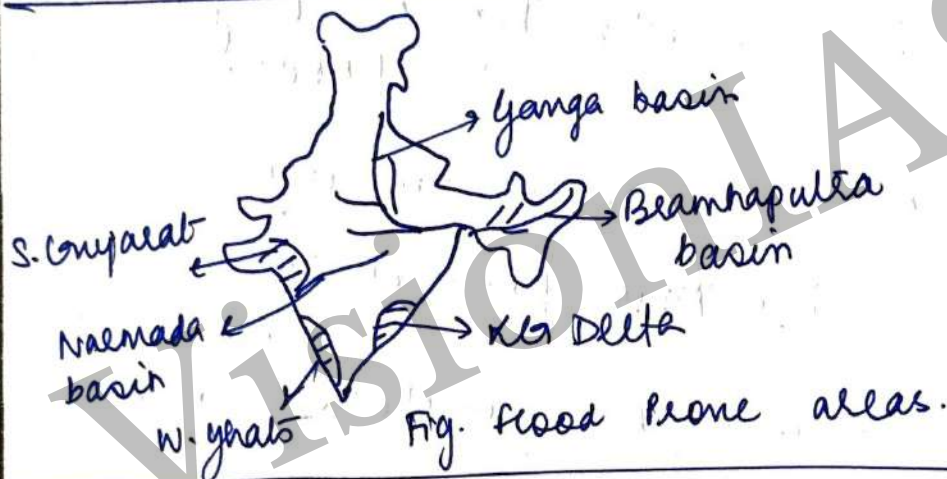
Thus, CDR can help reduce global warming by mitigation of CO<sub>2</sub> emissions to complement all Paris Agreement goals.

Q17.

भारत बाढ़ से संबंधित खतरों के प्रति संवेदनशील क्यों है? उपयुक्त उदाहरण प्रस्तुत करते हुए भारत के विभिन्न भागों में बाढ़ से संबंधित आपदाओं के लिए उत्तरदायी कारणों का विश्लेषण कीजिए।

What makes India vulnerable to flood-related hazards? Giving suitable examples, analyse the causes for flood-related disasters in various parts of India. (Answer in 250 words) 15

As per CWC, up to 12% of our land is prone to flooding, mainly in river basins.



### Reasons for vulnerability to floods

- ① accelerated glacial melt due to global warming.
- ② Erratic rainfalls due to climate change  
eg 2024 telangana floods.

- ③ citation of rivers and frequent change of course. Ex 2022 Assam floods
- ④ encroachment of natural water bodies & streams Ex Hyderabad floods.
- ⑤ Poor drainage and low focus on rainwater harvesting Ex 2023 Bangalore floods.
- ⑥ Lack of proper early warning systems Ex Arunachal flood of 2023.
- ⑦ Floods induced by cloudbursts and landslides. Ex Sikkim cloudburst of 2024.
- ⑧ land mining and destruction of natural flood barriers.  
Ex Koshi flood of 2022
- ⑨ Reduced percolation capacity of land due to asphalt roads.

Way forward to manage floods

- ① Proper zonation of flood prone areas  
using NRD's Bhuvan portal
- ② Efficient early warning systems  
eg Odisha's RIMES APP
- ③ Learning from traditional knowledge  
eg terrace farming in NE region
- ④ Promoting urban green cover &  
remove encroachments. eg HYDRAA model  
of Hyderabad
- ⑤ Adopting chinese 'sponge city' model
- ⑥ Replicating - Gujarat's approach for  
decentralised flood management.

Thus, efficient flood mitigation requires  
a combination of actions aligned with  
the 7 Sendai priorities.

Q18.

ISRO का आदित्य-L1 मिशन तथा NASA का पार्कर सोलर प्रोब सूर्य के अपने अध्ययन के संदर्भ में किस प्रकार भिन्न हैं?

How do ISRO's Aditya-L1 mission and NASA's Parker Solar Probe differ in their study of the sun? (Answer in 250 words)

15

The Parker Probe of NASA is expected to 'touch' the sun sometime around the end of the year whereas Aditya L1 has reached its orbit.

Aditya L1 Mission

- ① Launched to study solar coronal activity and regular updates on solar flares.
- ② Positioned at Lagrange point L1.



- ③ Maintain a stable orbit around the sun

- ④ will send regular data to ISRO over several years.
- ⑤ studies the sun from a considerable distance

### Parker Probe

- ① It is a fly-by mission to fly past the sun.
- ② will not have a stable orbit
- ③ will touch the solar corona from a very close distance.
- ④ It will gradually move out into outer space losing contact.
- ⑤ No regular updates, but studying the sun up close once.
- ⑥ focus not on periodic assessment of solar activity & hotspots.

Differences

Aditya L1	Parker Probe
① Fixed orbit	NO fixed orbit
② Long term information on solar activity	Will fly-by once near the sun
③ Distant from the sun	Will achieve close contact
④ Mission life of 4-6 years	Shorter life

Thus, while both Aditya L1 & Parker Probe are crucial for our understanding of solar activity, they adopt different approaches to study the same

Q19.

भारत की अर्थव्यवस्था और राष्ट्रीय सुरक्षा पर धन शोधन (मनी लॉन्ड्रिंग) के हानिकारक प्रभावों को रेखांकित कीजिए। इस समस्या से निपटने में सामना की जाने वाली चुनौतियों पर चर्चा कीजिए।

Bring out the detrimental impact of money laundering on the economy and national security of India. Discuss the challenges faced in countering this menace. (Answer in 250 words) 15

According to the World Bank,  
the global money laundering network  
has exceeded USD 1 trillion.

### Impact of money laundering

(A) for national security

↳ Black hole effect is promoted  
① that funds Nalco-terrorism

② strengthens other organised crimes  
like smuggling, gun running, etc

③ Insurgents often use money  
laundering for finance. Eg NSCN-IM  
in Nagaland

(B) for economy

① legitimate business fail to compete

- ② Loss of tax revenue to government
  - ③ Risk of global economic sanctions
  - ④ Deters foreign investors
- eg Venezuela crisis exacerbated  
by money laundering.

### Challenges to addressing money laundering

- ① Use of complex financial transactions  
through PFIS, P-Notes and shell  
companies
- ② Cryptocurrency has further harmed  
traceability.
- ③ Global hawala flows have gone  
online via the dark web.
- ④ Role of unfriendly neighbours in  
promoting such activities.
- ⑤ Porous borders and commission of

various organised crimes along them.  
eg Myanmar drug trade.

Way forward to curb ML

- ① Use of Wolfsberg principles of transparency  
International to strengthen banking  
surveillance
- ② Use of AI/ML to track illicit  
financial flows online.  
eg singapore FIM model
- ③ Strengthen border security using the  
CBMs technology.
- ④ Collaborate with neighbours to curb  
organised crimes. eg operation Sunrise  
w/ Myanmar
- ⑤ strict regulation of cryptocurrency

Thus, the threat of money laundering  
needs us to keep pace with the  
evolving technological scenarios.

Q20.

वैश्विक मंच पर अपनी प्रतिष्ठा को बढ़ाने के लिए रक्षा निर्यात भारत के लिए एक रणनीतिक अनिवार्यता है। विवेचना कीजिए। रक्षा निर्यात को बढ़ावा देने के लिए सरकार द्वारा कौन-से उपाय अपनाए गए हैं।

Defence exports are a strategic imperative for India to enhance its stature on the global stage. Discuss. What are the measures adopted by the government to bolster defence exports? (Answer in 250 words) 15

Per SIPRI data, India is now among the world's top 25 defence exporters as our exports have risen by 31% over 10 years.

### Significance of defence exports

- ① Boost our global hard power as a major military power.
- ② Deepen strategic partnerships through defence exports eg Brahmos to Philippines
- ③ Balance our current account deficit
- ④ Strengthen local industrialisation to crowd-in more investment.
- ⑤ Boost local capacity to reduce

dependence on foreign suppliers.

eg Indigenous AMCA project

- ⑥ Maintain stability in IOR and the larger Indo-Pacific.

### Government measures

- ① creation of Defence Modernisation Fund
- ② Defence Industrial Corridor in UP and Tamil Nadu
- ③ Positive Indigenisation list to promote domestic production
- ④ Local sourcing requirement for collaboration projects.
- ⑤ SRWAN portal
- ⑥ Aid to defence startups such as in the drone industry.

### Way forward to boost exports

- ① focus on fewer projects but with more attention
- ② ensure that delays are minimised in production
- ③ offering local manufacturing to allies to help reduce cost.
- ④ Reciprocal friendshoring policies to build complimentarities.
- ⑤ Boost local R&D expenditure to promote innovation.
- ⑥ entering into defence cooperation agreements Teg with Vietnam recently.

Thus, defence exports align with our Atmanirbhar aspiration and desire of realising SAR goal as well.